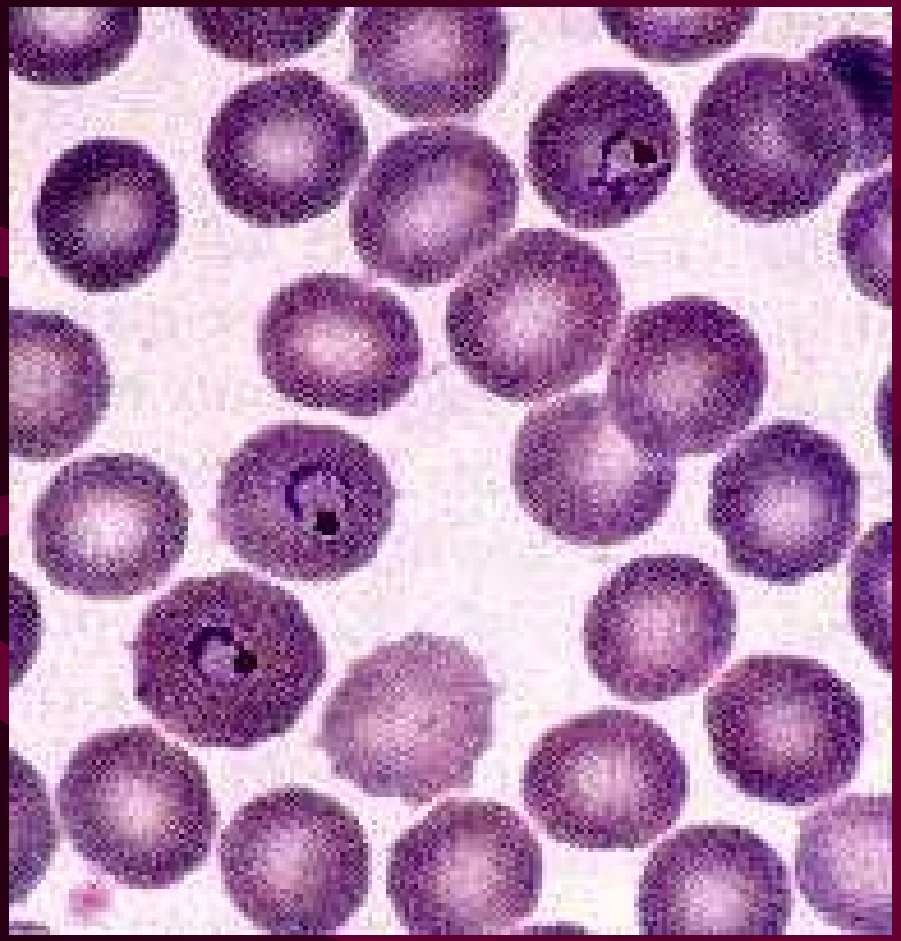
Specimen Recovery

- 1b. Given statements, identify clinical sites of infection and methods for recovery of significant parasites.
  - Sites of infection
  - Methods of recovery

Specimen Recovery



P. vivax trophozoites of peripheral smear

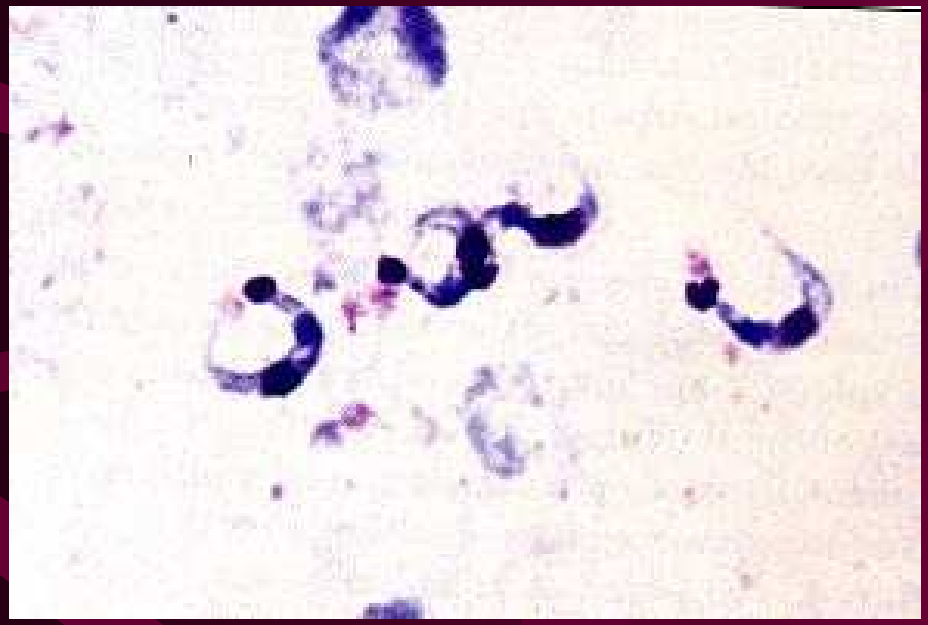
- Sites of infection:
  - **Blood**- usual parasites found in blood are malaria, microfilaria, and the trypanosomes
    - Methods of recovery
      - Thin smear-used primarily for species identification
      - Thick smears are useful in detecting malarial parasites in light infections
      - Examine at least 300 oil fields on thin smear
      - At least 100 fields on thick smear
      - + controls should be available

Specimen Recovery

- Bladder-samples should be allowed to settle for 1 or 2 hours
  - Looking for *S. haemaetobium,* which are found in the urinary veins of the bladder
    - Method of recovery:
      - Urine
      - Biopsy

Onchocerca volvulus from skin snip

Specimen Recovery



T. cruzi of peripheral smear

- Central Nervous System
  - *N. fowleri* causative agent of meningoencephalitis
    - Primarily found in the brain and the portal of entry is the nose
  - Method of recovery
    - L.P.

Specimen Recovery

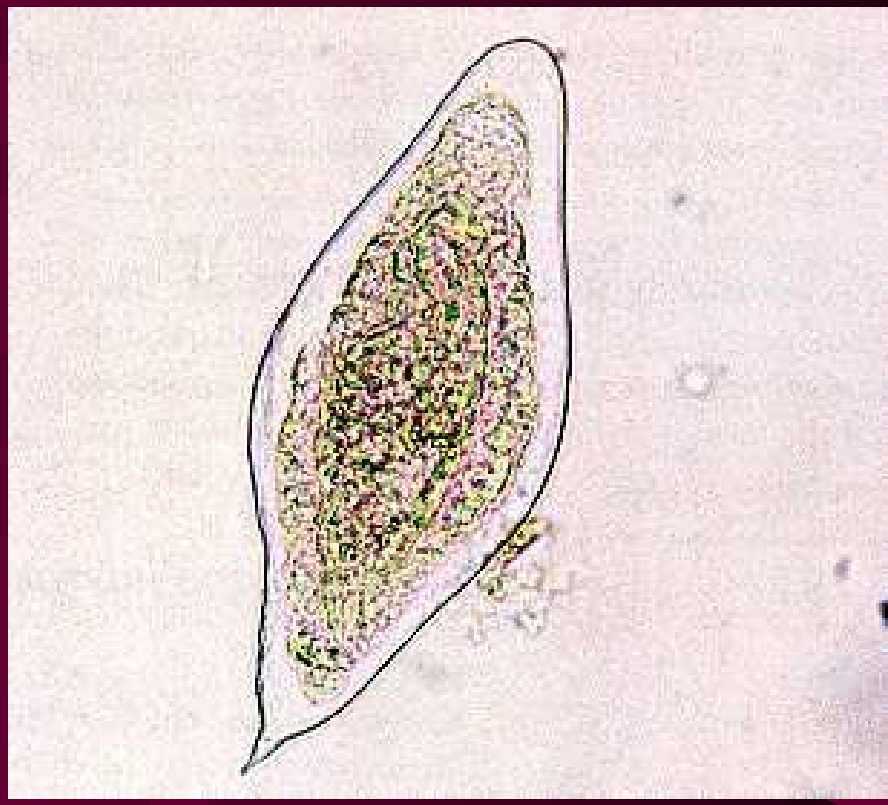
- Respiratory tract
  - Rare occasions, the larval stage of hookworm, *A. lumbricoides* or *S. stercoralis,* or the eggs of *P. westermani* may be seen in sputum samples
  - *E. histolytica* may be found in lung aspirate & pulmonary abscesses
- Intestine
  - Unicellular protozoans
  - Platyhelminths are found as well
  - Identified when passes in the feces/stool
  - The Sarcodina (amebas) class make up the vast majority of parasites

Specimen Recovery

- Bone Marrow
  - *L. donovani*- demonstration of amastigotes in stained smears taken from bone marrow aspirates can be seen
  - Found in monocytes, endothelial cells and macrophages (leukopenia)
- Tissue
  - Method of collection is through biopsy
  - *O. volvulus*- subcutaneous
  - *D. medinensis*- subcutaneous
  - *D. immitis*-subcutaneous or lungs
  - *T. spiralis*-skeletal muscle
  - *T. canis*-Liver, lung, brain, eye

Specimen Recovery

- Methods of recovery:
  - Blood
    - Malaria
      - Thick and thin smears
      - Should be collected at different times of the day
      - Stain with Giemsa or Wrights ASAP after collection
      - Stain and buffer must have pH between 7.0-7.2
      - Automated



S. haematobium egg in the urine

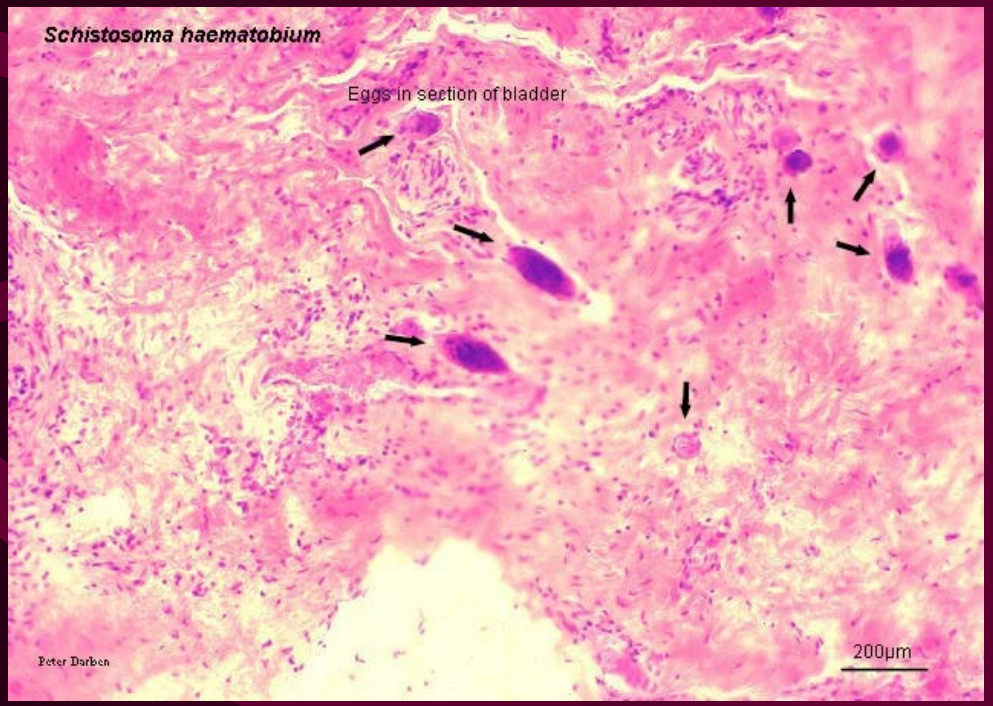
Specimen Recovery

- Blood contd…
  - Microfilaria
    - Includes trypanosomes and hemoflagellates
    - Trypanosomes
      - *T. gambiense*-W.A.S.S.
      - *T. rhodesiense*-E.A.S.S.
    - Hemoflagellates
      - *L. donovani*-Visceral leishmaniasis
      - *L. braziliensis*-Mucocutaneous leishmaniasis
      - *L. tropica*-Cutaneous leishmaniasis
- Feces
  - Perform collection before barium sulfate enema
  - Medications containing mineral oil, bismuth, antibiotics, antimalarials that may compromise the detection of intestinal protozoa
  - Collected in a clean, wide-mouthed container with a tightly fitted lid
  - 3 collections will usually suffice

Specimen Recovery

- Feces contd…
  - Preservatives
    - Polyvinyl Alcohol (PVA)
      - Widely used due to the performance of concentration procedures and the preparation of permanent-stained smears are both possible
      - Ratio of specimen to PVA is 1:4
    - Formalin
      - 10% formalin is a time-honored fixative
      - Does not allow for the preparation of permanent stained smears
      - aka SAF (Formalin with sodium acetate)
    - MIF (merthiolate-iodine-formaldehyde)
- PVA and formalin are the most widely used preservatives

Specimen Recovery



- Urine
  - *S. haematobium* infections
  - Symptoms:
    - Urinary disturbances, hematuria, lower abdominal pain
    - Eggs will be seen in urine
    - Lives primarily in the pelvic veins of the bladder

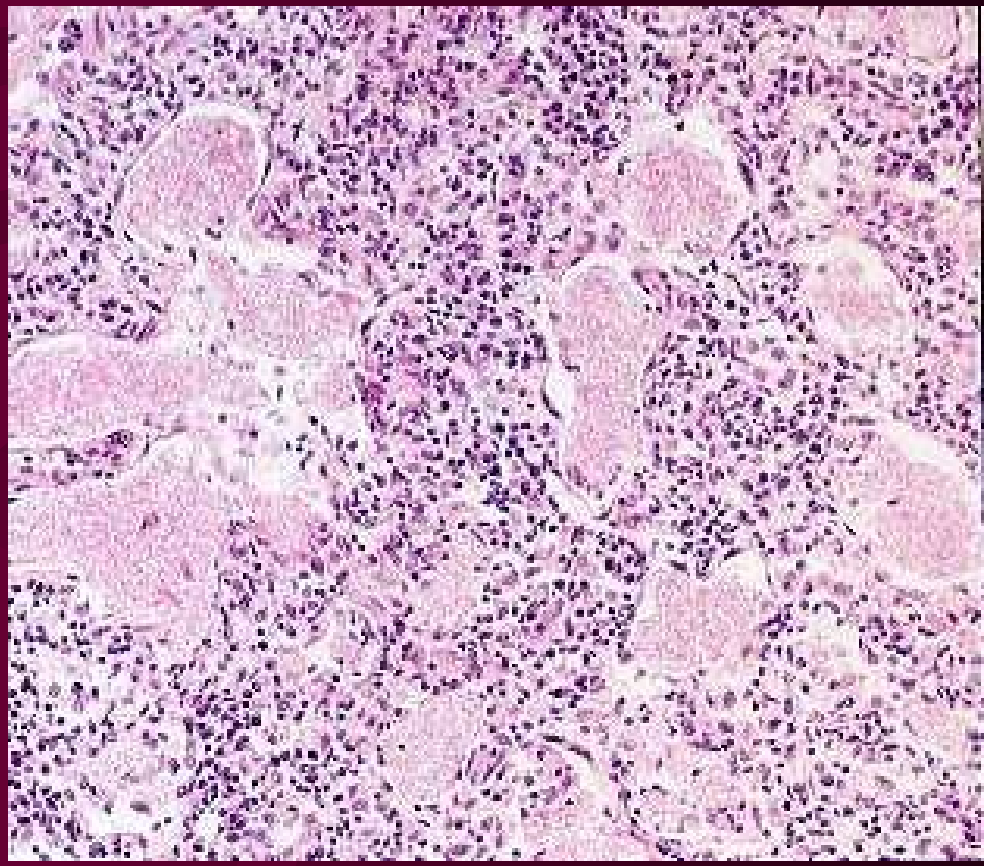
Specimen Recovery

Acanthamoeba spp. primarily found in the lungs

- Spinal fluid:
  - N. hartmanella and Acanthamoeba; use hematoxylin or eosin stain for exam
- Sputum:
  - Collect from lower respiratory tract; use saline or iodine wet mount

Specimen Recovery

- Tissue:
  - Biopsy material must be sent to the lab in a fresh state
    - P. carinii
    - Cryptosporidium spp.
    - A. keratitis
    - Cutaneous Leishmania
    - T. trichinalis
- Bone Marrow:
  - Leishmania forms



Pneumocystis carinii in a human lung biopsy

Summary

- 1b. Given statements, identified clinical sites of infection and methods for recovery of significant parasites.
  - Sites of infection
  - Methods of recovery